

CLAIMS

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1 A method for striping packets across pipelines of a processing engine within a network switch, the processing engine having a plurality of processors arrayed as pipeline rows and columns embedded between input and output buffers, each pipeline row including a context memory, the method comprising the steps of:

5 organizing the context memory as a plurality of window buffers of a defined size;
6 apportioning each packet into contexts corresponding to the defined size associated with each window buffer; and

8 correlating each context with a relative position within the packet to thereby facilitate reassembly of the packet at the output buffer, while obviating out-of-order issues involving the contexts of the packet.

1 2. The method of Claim 1 further comprising the step of organizing the processors and context memory of each pipeline row as a cluster.

1 3. The method of Claim 2 wherein the step of apportioning comprises the steps of:
2 segmenting the packet into fixed sized contexts at the input buffer;
3 sequentially passing the contexts to the clusters; and
4 storing the fixed sized contexts in appropriate window buffers of the context
5 memories.

1 4. The method of Claim 3 wherein the step of correlating comprises the step of providing
2 a program counter entry point function to indicate the relative position of each context
3 within the packet.

1 5. The method of Claim 3 wherein the relative position comprises one of a beginning,
2 middle and end context of the packet.

1 6. The method of Claim 3 further comprising the steps of:

2 processing the context at a source processor of the cluster;
3 communicating an intermediate result relating to processing of the context to a
4 destination processor of a neighboring cluster.

1 7. The method of Claim 6 wherein the step of communicating comprises the step of pro-
2 viding an intercolumn communication mechanism configured to forward the intermediate
3 result from the source processor to an address of the destination processor.

1 8. The method of Claim 3 further comprising the step of changing the size of a fixed
2 sized context at the context memory of a cluster.

1 9. The method of Claim 8 wherein the step of changing comprises the steps of:
2 deleting a portion of the fixed sized context stored in the window buffer; and
3 substituting the deleted portion of the context with information stored at another
4 location of the context memory.

1 10. The method of Claim 9 wherein the substituted information is one of larger than and
2 smaller than the deleted portion of the fixed sized context.

1 11. A system for striping packets across pipelines of a processing engine within a net-
2 work switch, the processing engine having a plurality of processors arrayed as pipeline
3 rows and columns embedded between input and output buffers, the system comprising:
4 a context memory within each pipeline row, the context memory organized as a
5 plurality of window buffers of a defined size;
6 a segmentation unit adapted to apportion each packet into contexts for processing
7 by the processors, each context corresponding to the defined size associated with each
8 window buffer; and
9 a mapping mechanism configured to correlate each context with a relative posi-
10 tion within the packet to thereby facilitate reassembly of the packet at the output buffer,
11 while obviating out-of-order issues involving the contexts of the packet.

1 12. The system of Claim 11 wherein the processors and context memory of each pipeline
2 row are organized as a cluster.

1 13. The system of Claim 12 wherein the mapping mechanism comprises a program
2 counter entry point function that indicates the relative position of each context within the
3 packet.

1 14. The system of Claim 13 wherein the relative position comprises one of a first, last
2 and intermediate portion of the packet.

1 15. The system of Claim 13 further comprising an intercolumn communication mecha-
2 nism configured to forward an intermediate result relating to processing of a context by a
3 source processor to a destination processor.

1 16. A computer readable medium containing executable program instructions for striping
2 packets across pipelines of a processing engine within a network switch, the processing
3 engine having a plurality of processors arrayed as pipeline rows and columns embedded
4 between input and output buffers, each pipeline row including a context memory, the
5 processors and context memory of each pipeline row organized as a cluster, the execut-
6 ble program instructions comprising program instructions for:

7 organizing the context memory as a plurality of window buffers of a defined size;
8 apportioning each packet into contexts corresponding to the defined size associ-
9 ated with each window buffer; and

10 correlating each context with a relative position within the packet to thereby fa-
11 cilitate reassembly of the packet at the output buffer, while obviating out-of-order issues
12 involving the contexts of the packet.

1 17. The computer readable medium of Claim 16 further comprising program instructions
2 for:

3 segmenting the packet into fixed sized contexts at the input buffer;

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